We Claim:

1. A method for forming propylene comprising providing a feedstock containing at least in part a first mixture of hydrocarbons comprising alpha olefins, internal linear olefins, and isoolefins having four carbon atoms per molecule, introducing said feedstock into a combination hydrogenation/double bond isomerization zone wherein (1) any diolefins and acetylenes that may be in said feedstock are converted at least in part to alpha and internal linear olefins, and (2) at least part of said alpha olefins in said feedstock and at least part of said alpha olefins formed by said hydrogenation are converted to additional internal linear olefins thereby producing as a product of said combination zone a second mixture that is enriched in internal linear olefins, passing said second mixture into a metathesis zone which favors the disproportionation of internal olefins with ethylene to produce propylene as a product of the process, recovering from said metathesis zone a third mixture separate from said propylene product that contains at least in part alpha olefins, internal olefins, and isoolefins, passing said third mixture into a skeletal isomerization zone wherein said isoolefins are converted at least in part to additional internal linear olefins to form a fourth mixture that is enriched in internal linear olefins, returning said fourth mixture as co-feed to at least one of said combination zone and said metathesis zone for the production of at least one of additional internal linear olefins in said combination zone and additional propylene in said metathesis zone.
2. The method of claim 1 wherein said fourth mixture is returned as co-feed to said metathesis zone.
3. The method of claim 1 wherein said first mixture contains at least in part butene-1, butene-2, and isobutylene, said combination zone contains at least one catalyst that promotes the hydrogenation of butadiene and acetylene and the formation of butene-2 from butene-1, said metathesis

zone contains at least one catalyst that promotes the disproportionation of butene-2 with ethylene to form propylene, said skeletal isomerization zone contains at least one skeletal isomerization catalyst that promotes the conversion of isobutylene to a mixture of butene-1 and butene-2, said mixture of butene-1 and butene-2 along with any unconverted isobutylene being recovered from said skeletal isomerization zone as said fourth mixture.

4. The method of claim 3 wherein said combination zone operating conditions are a temperature of from about 70°F to about 300°F, a pressure of from about 20 psig to about 560 psig, and a weight hourly space velocity of from about 0.5 h^{-1} to about 20 h^{-1}.
5. The method of claim 3 wherein at least one of diolefins and acetylenes are initially present in said feed stock and are hydrogenated in said combination zone at least in part to additional butene-1 and butene-2.
6. The method of claim 3 wherein said metathesis zone operating conditions are a temperature of from about 300°F to about 800°F, a pressure of from about 200 psig to about 600 psig, and a weight hourly space velocity of from about 1 h^{-1} to about 100 h^{-1}.
7. The method of claim 3 wherein said skeletal isomerization operating conditions are a temperature of from about 450°F to about 1,200°F, a pressure of from about 0 psig to about 150 psig, and a weight hourly space velocity from about 1 h^{-1} to about 50 h^{-1}.
8. The method of claim 3 wherein said combination zone catalyst is at least one of palladium, platinum, nickel, and rhodium carried on an acidic support.
9. The method of claim 4 wherein said metathesis zone catalyst is at least one of halides, oxides, and carbonyls of at least one of molybdenum, tungsten, rhenium, and magnesium carried on a support.

10. The method of claim 3 wherein said skeletal isomerization zone catalyst is at least one zeolite having one dimensional pore structures with a pore size ranging from greater than about 0.42nm and less than about 0.7nm.
11. The method of claim 1 wherein said feedstock contains, in addition to said first mixture, butadiene, vinyl acetylene, n-butane, isobutane, and hydrogen; in said combination zone said butadiene is at least partially hydrogenated to additional butene-1; in said metathesis zone butene-2 is used in the making of propylene to make said third mixture depleted in butene-2 content; and in said skeletal isomerization zone additional butene-2 is formed to make said fourth mixture enriched in butene-2 for return to the process to convert at least part of said butene-2 in said fourth mixture into additional propylene.
12. The method of claim 10 wherein said fourth mixture is employed as co-feed to said metathesis zone.
13. The method of claim 10 wherein a purge stream containing at least one of butane, butene-1, butene-2, and isobutane is removed from at least one of said third mixture and said fourth mixture.
14. The method of claim 12 wherein said purge stream is employed in an alkylation zone to form an alkylate of mixed isooctanes.
15. The method of claim 12 wherein said mixed isooctanes are gasoline grade.